Notebook, N-90-02-06.1

This notebook covers the period February-May 1891. There is also one entry from February 1890. It was used by one or more unidentified experimenters for notes and calculations regarding ore separation and assays, chemical analyses of stearic acid, experiments with chlorine, and tests of lubrication for a small motor. The front cover is labeled "594." The spine is labeled "108." The book contains 93 numbered pages, beginning with page 101; the first 100 pages have been removed from the book.

Only the material relating to ore separation and lubrication experiments has been filmed.

Iron Magnetic Ore.

$23\frac{3}{10}$ cc permangan. = 100 cc of (500 cc iron solution = 2 grm ore)

23.3
.0086609 Fe in 1 cc

20977
13998
13998
1864
.20179897 Fe in 23.3

23.3 cc = .201 iron.
5
1.005 " = 2 grm ore
50
50.250 = % iron in

iron magnetic separations:

1st 23.3 cc
~~2nd 23.7 cc~~
3rd 21.3 cc

23.3
21.3
44.6 | 2
22.3

22.3 cc per mangan. sol. = $\frac{1}{5}$ of ore.
2 grm ore = .96565 Fe = 48.282%

Weight of Platinum crucible, 27.1785 grams.

Crude Iron Ore.

1st 24.8 c.c. of Permanganate Solution = 1/5 of 2 grams Iron Ore. = 53.49 %

5 grams zinc dissolved in solution, residue 4.227 grams
was reduced to colorless solution

2nd 29 cc of Permanganate solution = ~~20~~ 1/5 of 2 gram ore.

1.25570 Fe in two gram. = 62.79%
was reduced to violet

5 grams of zinc dissolved in 2nd 100 c.c of iron solution : residue - 2.893 grams

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Was reduced to beginning of violet.

$25\frac{7}{10}$ cc = 1/5 of 2 g ore. 5 gram Zn. 3.9 ...

Reduced by H_2S 100 cc of the 500 cc of iron solution = 23 cc permanganate = 1/5 of 2 g ore.

Weight of residue of zinc from 5 grams, 3.900 grams.

5th 100 cc iron solution, allowed to reduce completely (12 hrs.)

29 4/10 cc = 1/5 of 2 grm.

Then from 29 4/10 - 2 cc for iron contained in 5 grm zinc =
27 4/10 cc = iron + titanium
23 cc for iron. in 1/5 of 2 grm -
4 4/10 cc = titanium in 1/5 of 2 grm crude ore.

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magnetic separation.

1st Complete reduction by zinc

zinc used = 5 grm
" remaining = 1.081

zinc consumed = 3.919

29 cc stand sol = 1/5 of 2 grm -

2nd Reduced by H_2S
25 cc stand sol = 1/5 of 2 grm.

non magnetic.

1st reduced complete by zinc
20 cc = 1/5 of 2 grm -
noticed the violet tint leave after 6 cc had been added,
zinc used 5 grm.
" ~~consumed~~ 4.118
" consumed .882

2 nd by H_2S

$11\frac{1}{2}$ cc = $\frac{1}{5}$ of 2 gms.

2 ?
11.5
8.5

Manganese

magnetic sample –

.019375 Mn_3O_4 in 5 gms ore

.27% Mn

Weight of zinc residue 1.001 gram

Standardizing permanganate solution for titanium.

20 cc ~~= .1500 gm Ti~~

5.6 cc iron in the zinc used for reduction
14.4 = .500 gm titanium oxide.

1 cc = .0347 gm titanic acid =
.02115006 titanium

Magnetic separation

Wt of Pt crucible in Titanium estimation = 27.165600
ash = .008775

27.156825

Crucible + precipitate + paper = 27.2251
27.1568

Titanium oxide in ½ gm. .0683
which contains .0148 Fe_2O_3

TiO_2 in ½ gm. – .0535
2

TiO_2 in 1 gm .1070

Ti in 1 gm ore = .065248

Ti in 100 gm = 6.5248

Experiments on a New Lubricant for the Small Motor.

#1
Melted napthalene and added ordinary Machine oil (Lard Oil) not very stiff.

Percent napthalene 71 %
" oil 29 %

#2 Melted napthalene and added lard, much stiffer than #1

Percent napthalene 66 %
" Lard 34 %

#3 melted napthalene and added a compound consisting of 20 parts albany Grease and 1 part Lard Oil better than #1 & 2

Percent Napthalene 60 %
" Compound 40 %

#4
Melted napthalene and added compound in #3. Better than any other.

Percent napthalene 50 %
" Compound 50 %

#5 Melted Albany grease and added napthalene

Weight of albany grease 5.3 gr
Weight of dish and resultant material 1 lb 2 gr
Weight of dish 11/2 gr
Weight of napthalene
Percent "
albany grease
Probable percent of napthalene 50%

Caustic Soda ~~13~~ 1

100 c.c Alcohol, used in each case 13.2

100 c.c. Alcohol 13.6

.4 c.c solution

alcohol =

21

2 grs sample

100 c.c. Alcohol,

31.2
13.8
31.8 - 14

x 17.4 =

0.106389
17.4

42556
744723
106389

1.8511686

92.5584 3 %

22

2 grs sample

100 c.c alcohol,

49.2
31.8
49.6 - 4

.106389 x 17.4 = 92.55843 %

#23

2 grs sample
100 c.c. Alcohol

67.4
49.8

67.8 - .4

.106389 × 17.6 =

106389
176

638334
744723
106389

1.87244464

93.622329 %

#24

2 grs sample
100 c.c. Alcohol

85.0
67.8

85.4 - .4

.106389 × 17.2 =
17.2

212778
744723
106389

1.8398908

91.99454 %

25

101.2
2.4
4.6

2 grams sample
100 c.c. alcohol

103.0
85.4
103.4 - 4

.106389 x 17.6 = 93.62232%

26

2 grams sample
100 c.c. alcohol

41.6
24.0
42.0 - .4

.106389 x 17.6 = 93.62232

27

2 grams sample
100 c.c. alcohol.

22.4
4.6
22.8 — 4

.106389 X 17.8 =

.106389
178

851112
744723
106389

1.8937242

94.68621 %

Table of equivalents of c.c. in grs. of stearic acid for samples sent from Silver Lake. Solution being a standard Na HO solution of 1.015 sp. G. 1 c.c. = 0.106389 g

#6 Lubricator
May 11 - 1891

~~2 part Lard~~
~~1 part Tallow~~
~~2 % of bulk of caustic soda~~ (See No 7)

4 ozs Lard
#7 2 ozs Tallow
.12 oz Caustic Soda = ~~[illegible]~~ 1/8 oz
used 13.5 grams sodium Hydrate
70.2 grms caustic soda solution
of 1.201 sp gr
Too much soda

#8 56 grams lard
28 grams tallow
17.3 grams caustic soda solution
containing 13% caustic soda, =
1% of the 84 grams.
Too much soda,

#9 56 grams lard
28 grams Tallow
8.75 grams soda solution containing 13% caustic soda = 0.5% caustic

#10 56 grams lard.
56 grams tallow
8.75 grams solution of NaOH

#11 10 grams #10
10 grams napthalene, quite a good stick

#12
100 parts Albany Grease
25 parts napthalene
10 parts tallow